Validation and translation of the Kihon Checklist (frailty index) into Brazilian Portuguese

（基本チェックリスト・ポルトガル語訳版の作成とブラジル人高齢者におけるその検証）

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ORIGINAL ARTICLE

Validation and Translation of the Kihon Checklist (frailty index) into Brazilian Portuguese

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ABSTRACT

Aim: To translate the Japanese Kihon Checklist (frailty index) into the Portuguese language and to validate the use of the checklist for the assessment of the elderly Brazilian population.

Methods: A semantic analysis was conducted, along with pre-testing with bilingual subjects. The checklist was validated against the Edmonton Frail Scale.

Results: A total of 188 Brazilian older adults (mean age 69.5 ± 7.47 years) participated in this study. In the semantic analysis, six elderly subjects reported no difficulty with responding to the Portuguese version of the Kihon Checklist. During pre-testing with 21 bilingual subjects, we found a strong correlation between the total scores of the original version of Kihon Checklist in Japanese and the translated version in Portuguese ($r=0.764$, $p<0.001$). According to the validation process, which involved 161 subjects, there was a significant correlation between the total scores of the Kihon Checklist and the Edmonton Frail Scale ($r=0.535$, $p<0.001$) and between each domain of the checklist with the total score of Edmonton Frail Scale (lifestyle $\tau=0.429$, $p<0.001$; physical strength $\tau=0.367$, $p<0.001$; nutrition $\tau=0.211$, $p=0.002$; eating $\tau=0.213$, $p=0.001$; socialization $\tau=0.269$, $p<0.001$; memory $\tau=0.285$, $p<0.001$; and mood $\tau=0.359$,

p<0.001). Moreover, the Portuguese version of the Kihon Checklist demonstrated satisfactory internal consistency (Cronbach’s α coefficient: 0.787).

Conclusions: The Portuguese language version of the Kihon Checklist presented good internal consistency and validity. Therefore, we encourage its application in the elderly Brazilian population with an aim of monitoring their frailty to prevent or delay the functional dependence and any other adverse health outcomes.

Keywords: Kihon Checklist; frailty; community-dwelling older people; validation; Edmonton Frail Scale.

1 Introduction

The rapid increase in the number of frail older adults is considered a major health care challenge[1,2]. In recent years, the term ‘frailty’ has been repeatedly discussed in the research literature, and several definitions have been proposed[3]. However, there is insufficient evidence to accept a single definition of frailty, and no single definition is currently considered to be a gold standard[4]. In general, there are two predominant approaches to defining frailty: i) frailty is treated as a count of health impairments[5,6] and ii) the frailty phenotype is identified to detect people who find themselves between the independent and the dependent life stages[7].

Independent of the adopted approach, valid and low-cost frailty assessment tools are needed for both research and clinical purposes[8]. Therefore, the Japanese Ministry of Health, Labour and Welfare proposed a frailty index named the “Kihon Checklist” (KCL) that identifies vulnerable older adults as those with a higher risk of becoming dependent[9,10]. The KCL is used for screening frail older adults and is based on the needs of the Japanese long-term care insurance system[11]. The KCL has 25 yes/no questions divided into domains: lifestyle, physical strength, nutrition, eating, socialization, memory, and mood (Table 1). A subject is identified as exhibiting frailty if they score 10 points or more in the lifestyle domain. In addition, the results of the KCL

may be analyzed separated by each domain. Scoring three points or more indicates low physical strength in the respective domain, and scoring two points indicates low nutritional status in the respective domain. Scoring two points or more in the eating domain suggests low oral function. A negative answer on question number 16 indicates "house-boundedness", one point or more in the memory domain suggests low cognitive function, and finally, scoring two points or more in the mood domain indicates depression risk[12,13].

- **INSERT TABLE 1 HERE-**

The KCL has been used in several Japanese studies. Ogawa *et al.* (2011) concluded that the KCL demonstrated a good concurrent validity against the Fried's criteria for evaluating frailty. The KCL in that study had a sensitivity of 60% and a specificity of 86.4%[14]. Fukutomi *et al.* (2012) demonstrated that the risk groups in all categories in the KCL were associated with lower activities of daily living, lower subjective quality of life scores, and higher scores on the geriatric depression scale[12]. Another study used the KCL as an important assessment tool for investigating the cost-effectiveness of a community-based exercise program that reduced and prevented the necessity for care and disability in frail Japanese older adults[15]. Considering the

contributions of the KCL to the research, clinical, and policy-making spheres, it is an important and versatile measurement that should be extended to countries such as Brazil, which is lacking in frailty assessment tools, that can be easily applied to the aged population and that can be applied to communities where the number of elderly (in Brazil, determined by the chronological age of 60 years or older) is rapidly increasing as other developing countries. Between 1999 and 2009, the number of the country's residents who are at least 60 years grew from 9.0% to 11.4%, reaching 21 million inhabitants, according to the Brazilian Institute of Geography and Statistics[16]; and this number is expected to rise to 29.8% of Brazil's total population by the year old 2050[17]. Therefore, our purpose was to develop the KCL for use with elderly Brazilian adults by translating a version into Brazilian Portuguese and adapting it to the Brazilian culture.

2 Materials and methods

This was an epidemiological observational study.

2.1 Participants

The subjects were recruited by municipal health units and by a recreational club in Curitiba, Paraná State. The inclusion criteria were living in the community, aged

60 years or older, and being able to respond to the questionnaire. The additional inclusion criterion for the pretest of beta version was being bilingual (Japanese and Brazilian Portuguese speaker); and for the validation of the Kihon Checklist – Brazilian Portuguese version was being able to perform the physical tests. The subjects who did not match these criteria or those who did not want to participate in research procedures voluntarily were excluded from this study. The southern area of the country was chosen due to the large population of Japanese subjects in the region.

The municipal health units regularly organize meetings to promote health education, physical exercise practice, group activity, and other activities, and the units were chosen due to their direct contact with a variety of community-dwelling elderly adults. The second recruitment location was a recreational club that promotes Japanese culture with activities directed at all community members, not exclusively Japanese ones. Considering the number of older adults engaged in the activities offered by the health units and the recreational club, the estimated number of members potentially eligible to participate in this research was 120 subjects from the first recruitment location and 250 subjects from the second location.

The subjects were recruited from April to June 2012; the older adults’ members of those institutions received oral and written explanation about the research procedures

by the researchers themselves and the leaders of the recreational groups offered by those institutions. The participation in this study was voluntary, and all subjects signed an informed consent form. A total of 218 subjects were recruited to participate in this research (99 older adults from the health units and 119 members from the recreational club); however we excluded 30 subjects (15 in each institution) from the analysis due to age lower than 60 years old and poor responses in questionnaires, remaining 188 community-dwelling Brazilian older adults (84 from the health units and 104 from the recreational club) (Table 2).

- **INSERT TABLE 2 HERE -**

Data collections were performed in June 2012. The study protocol was approved by the Kyoto University Graduate School of Medicine Ethics Committee (E-1575).

2.2 *Procedures*

In accordance with previous validation studies[18,19,20], the procedures of this study consisted of semantic analysis with six volunteers along with pre-testing with 21 bilingual subjects (Japanese and Brazilian Portuguese speakers), and the validation

procedure involved 161 participants.

2.2.1 Translation of Kihon Checklist – original version to Brazilian Portuguese language.

The translation of the KCL into Brazilian Portuguese was performed by two native Brazilians members of this study project. Each researcher prepared a Brazilian Portuguese translation, discussed both versions and then prepared an initial Brazilian Portuguese version of the KCL (KCL-PT). This version was then reviewed by a native Brazilian specialist in the Portuguese language.

Next, the KCL-PT was back translated into Japanese by two Brazilian Japanese language experts who were not previously aware of the KCL-PT. The translators received the initial translated version and translated it back into Japanese. After each translator prepared a version, they discussed their translations and then prepared the final KCL-PT back-translated version that was submitted for analysis by a Japanese committee of specialists.

The committee of specialists aimed to verify if the KCL-PT back translation contained any questions with different meanings compared with the original Japanese-language version of the KCL. When the specialists approved the

back-translated version, assured of the content similarity between both versions, the version translated into Brazilian Portuguese was designated the KCL-PT alpha version, and the study proceeded to semantic analysis.

2.2.2 *Semantic analysis of the Kihon Checklist – Brazilian Portuguese alpha version*

The study volunteers were asked to answer the KCL-PT alpha version and a feedback report. The report was analyzed to verify if there was any topic in the checklist that was difficult to understand. If there was a topic with such problem, we modified the checklist and restarted the semantic analysis. When the feedback reports indicated satisfaction with the modified checklist, we designated the modified version as the beta version (Table 3) and submitted it for pre-testing with bilingual subjects.

- **INSERT TABLE 3 HERE -**

2.2.3 Pretest of beta version with bilingual subjects (Japanese and Brazilian Portuguese speakers)

The volunteers were asked to answer the two KCL versions (the KCL original version in Japanese and the KCL-PT beta version in Portuguese). When both checklists

correlated significantly (see statistical analysis section for further details), we designated the Portuguese version as the KCL-PT and submitted it for validation.

2.2.4 Validation of the Kihon Checklist – Brazilian Portuguese version

The subjects were asked to perform two assessments that measure frailty, the KCL-PT and the Edmonton Frail Scale (EFS), which was chosen because it has already been translated to Portuguese, adapted to Brazilian culture and successfully validated in Brazil[18]. In addition, the EFS was chosen because it has potential as a practical and clinical measure of frailty with good construct validity, good reliability, and acceptable internal consistency[21]. The EFS addresses cognition, balance and mobility, mood, functional independence, medication use, social support, nutrition, healthy attitudes, continence, burden of medical illness, and quality of life. Higher levels of frailty on the EFS are represented by higher scores, with a maximum possible score of 17 points [18].

2.3 Statistical analysis

The Kolmogorov-Smirnov test was used to verify the normality of the data. Descriptive analysis was used to verify the feedback reports during the semantic analysis. We used Spearman's correlation analysis to investigate the correlation between

the total scores of the original Japanese version of the KCL and the KCL-PT during pre-testing with bilingual subjects and to verify the correlation between the KCL-PT and the EFS during the validation process. In addition, we used Kendall’s Tau to verify the correlation between each KCL-PT domain with the total score of the EFS. The bivariate comparisons of the EFS total score between the KCL-PT frail subjects and non-frail subjects were analyzed with the Mann-Whitney U test. Multiple regression analysis was used to verify the contributions of the KCL-PT to the EFS. Finally, we calculated a Cronbach’s α coefficient to verify the internal consistency of the KCL-PT. All analyses were performed using the Statistical Package for the Social Science (SPSS, IBM Inc., Chicago, IL, USA), version 20.0.

Results

Translation process

After the analysis by the Japanese specialists, it was suggested that we modify question number 14 of the back-translated KCL-PT version. The newly generated version was submitted for a second analysis and was subsequently approved.

Semantic analysis

In the semantic analysis, a total of six community-dwelling Brazilian older women (mean age 67.0 ± 9.91 years) answered the KCL-PT alpha version and the feedback report. The majority of subjects (66.7%) needed approximately 10 to 15 minutes to respond to the KCL-PT alpha version, and the language used in the checklist was considered to be very easy or easy to understand, according to their reports. In addition, the subjects reported that the checklist contained no questions that were difficult to answer or uncomfortable. All subjects reported that the checklist included their main questions concerning frailty.

Bilingual subjects

A total of 21 subjects (mean age 73.8 ± 8.98 years) answered both versions of the KCL. The median scores of the original Japanese KCL was 2 points (min 0 - max 9), and the median scores of the KCL-PT beta version in Brazilian Portuguese language was also 2 points (min 0 - max 6). There was a strong correlation between the total mean scores of both versions ($r=0.764$, $p<0.001$).

Validation process

A total of 161 subjects (mean age 69.1 ± 7.0 years) answered the KCL-PT and

the EFS. The median score of the KCL-PT was 3.5 points (considered to represent non-frailty according to the reference score, min 0 - max 13), and the median score of the EFS was 3 points (considered to represent non-frailty according to the reference score, min 0 - max 10). Moreover, the total scores of the KCL-PT and EFS presented a significant correlation ($r=0.535$, $p<0.001$) when analyzed with Spearman’s correlational analysis and scatter plot (Figure 1).

- INSERT FIGURE 1 HERE –

The KCL-PT (25 items) demonstrated a satisfactory internal consistency (Cronbach’s α coefficient: 0.787). The median score for the various domains was as follows: lifestyle, 3 points (min 0 - max 13); physical strength, 1 point (min 0 - max 5); nutrition, 0 points (min 0 - max 1); eating, 1 point (min 0 - max 3); socialization, 0 points (min 0 - max 2); memory, 1 point (min 0 - max 3); and mood, 0 points (min 0 - max 5).

Moreover, all the domains of the KCL-PT correlated with the total score of EFS. The KCL-PT score explained approximately 39% of the EFS score ($R^2=0.387$, $p<0.001$). The domain with the highest influence on the EFS score was physical strength (coefficient $\beta=0.330$, $p=0.03$), followed by mood (coefficient $\beta=0.196$, $p=0.01$) (Table 4).

- **INSERT TABLE 4 HERE -**

The subjects were divided into non-frail and frail groups according to the KCL-PT frailty score cutoff points, and we verified that the EFS total score differed significantly between the groups. The KCL-PT frail group was also frailer than the non-frail group according to the EFS, as they presented higher total scores (Table 5).

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Discussion

The results of the translation and validation of the KCL-PT procedures were satisfactory. The total score of the Brazilian Portuguese language beta version strongly correlated with the original version of the KCL ($r=0.764$, $p<0.001$), as we observed in the results of the pre-testing with bilinguals subjects. In the validation procedure, the total scores of the KCL-PT and the EFS were moderately correlated ($r=0.535$, $p<0.001$), and all domain scores of the KCL-PT were correlated with the EFS total score. Moreover, there was a difference in EFS total scores between the subjects who were considered frail and those who were considered non-frail according to the KCL-PT.

The KCL-PT domain with the highest influence on the EFS total score was physical strength (coefficient β=0.330, p=0.03). Several studies consider that physical function is a particularly important aspect when determining frailty and have reported that a decline of muscle mass, mobility, and balance is associated with becoming frail[22,23,24]. Therefore, it is valuable to focus on physical function to prevent disabilities in performing activities of daily living (ADL) and also in instrumental activities of daily living (IADL), which is one of the principal factors for institutionalization and is also associated with mortality among older adults[25,26]. However, frailty is not unidimensional; the focus must be extended to include aspects such as cognition, mood, and social support[21]. In our study, we verified the contribution of the mood domain score of the KCL-PT to EFS total score (coefficient β=0.196; p=0.01). Evidence suggests that depression in the aged population is also associated with functional impairment and increased mortality[27,28].

The EFS does not directly address the lifestyle, eating, or socialization domains that are addressed by the KCL-PT. Those differences may explain the low regression coefficients of these domains with the EFS total score. It was intriguing that the nutrition and memory domains of the KCL-PT, which have corresponding domains in the EFS, did not present a significant regression coefficient for the EFS total score.

However, when we analyzed just the specific domains, and not the total EFS total score, we verified a significant correlation between those domains (nutrition domain Kendall’s τ coefficient=0.483, $p<0.001$ and memory domain, Kendall’s τ coefficient =0.221, $p=0.002$).

Although the KCL-PT domains presented a significant regression coefficient with EFS, the value may be considered low ($R^2= 0.387$, $p<0.001$). The EFS domains such as general health state, social support, medication use, and continence that were not directly investigated by the KCL-PT may represent the remaining coefficient value that is unexplained by KCL-PT. Despite these differences, the essences of both frailty assessments were deemed similar because their total scores were significantly correlated, suggesting that the EFS was a suitable assessment of frailty for use in validating the Kihon Checklist in Brazil.

Although this is a pioneer study using the KCL in Brazil, we unfortunately could not compare our results with other Brazilian studies present in the literature. Despite this limitation, we believe that the quality of the KCL-PT was satisfactory in terms of internal consistency (Cronbach’s α coefficient = 0.787), and the KCL-PT is considered a valid frailty index for use with elderly Brazilian adults because its results

correlated with those of the already-validated EFS. Therefore, we suggest the use of the KCL-PT to screen and monitor the elderly Brazilian population's frailty conditions.

Even though frailty confers morbidity, mortality, and healthcare costs[1,7], causing an increased strain on all healthcare systems and family structures, this type of syndrome can be avoided or delayed with identification and early intervention[1]. The awareness of this syndrome and its risks can be useful in supporting the care of frail elderly patients by health care workers and thus can decrease patients' risks for adverse health outcomes[29]. Therefore, the ability to measure frailty is critical for this process at a health care policy level, as well as clinically, and information about frailty can support program planners by identifying the range of services that might be required and the anticipated level of need for those services. Clinically, frailty stratification can help in planning interventions or predicting a patient's risk of death or need for institutional care[30]. The KCL-PT can be used to answer this emergent and emergency demand in screening the frailty of the elderly Brazilian population as a first step in facing and confronting frailty in this population.

This study has several limitations, including the limited sample size and possible bias due to the choice of recruitment location. We suggest future studies that recruit a larger sample size, include different regions of Brazil and different institutional

settings, such as communities for the elderly (urban and rural areas), nursing homes, and other settings. Moreover, additional studies to verify the association of the KCL-PT with other measures of health are necessary.

We successfully translated the KCL into Brazilian Portuguese and validated the instrument’s application in an elderly Brazilian population. We encourage the application of the KCL-PT to investigate frailty in older adults with an aim of preventing or delaying functional dependence and other adverse health outcomes caused by the aging process. Given the simple 25 yes/no question structure of the KCL-PT, the checklist is suitable for clinical application, research, and the needs of policy makers.

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Disclosure statement

No potential conflicts of interest were disclosed.

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Figure 1 Correlation between the total scores of the Kihon Checklist and the Edmonton Frail Scale

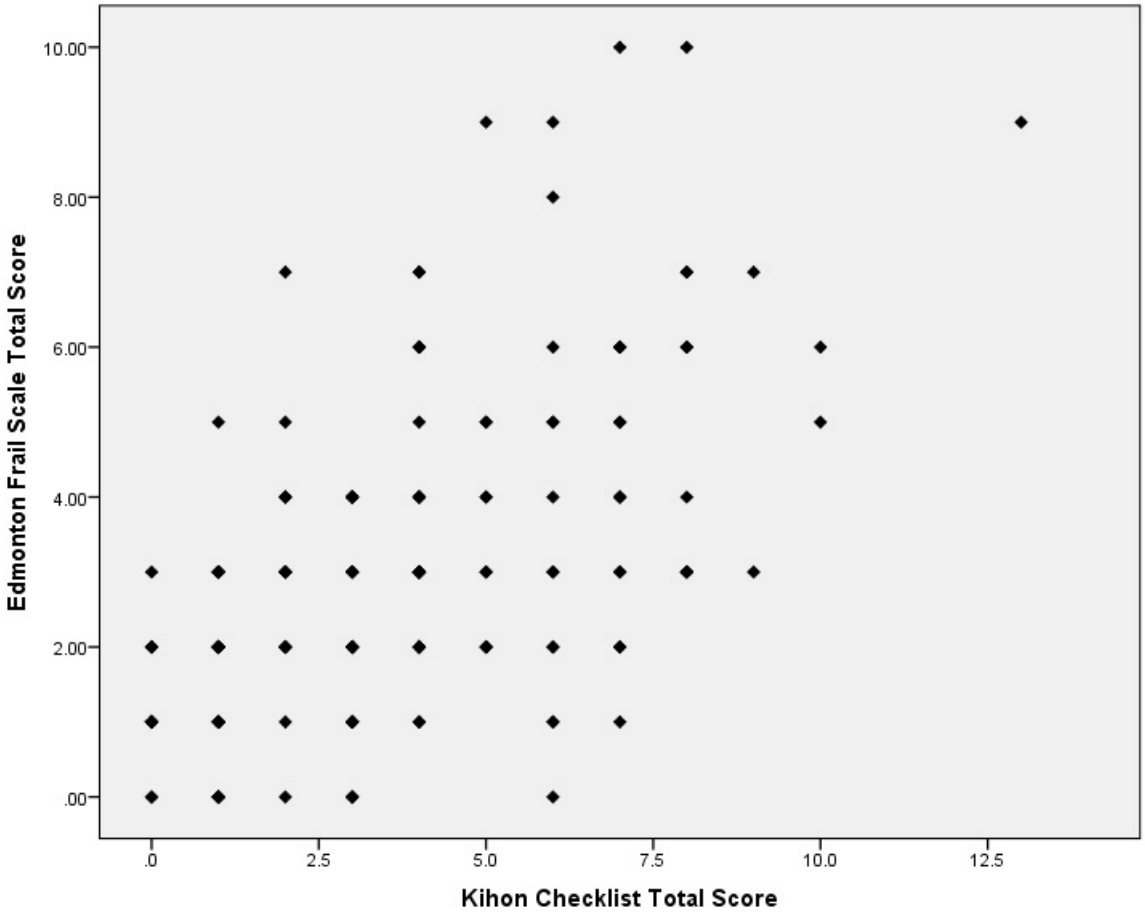

Table 1 Kihon Checklist

1	Do you use public transport (bus or train) to go out by yourself?	0.Yes	1.No
2	Do you shop for daily necessities?	0.Yes	1.No
3	Do you manage financial matters such as savings or deposits by yourself?	0.Yes	1.No
4	Do you visit the homes of friends?	0.Yes	1.No
5	Do you give advice to friends or family members?	0.Yes	1.No
Physical Strength			
6	Are you able to go up stairs without using handrails or the wall for support?	0.Yes	1.No
7	Are you able to stand up from a sitting position without support?	0.Yes	1.No
8	Are you able to walk continuously for 15 minutes?	0.Yes	1.No
9	Have you experienced a fall in the past year?	1.Yes	0.No
10	Do you feel anxious about falling when you walk?	1.Yes	0.No
Nutrition			
11	Has your weight declined by 2 to 3 kg in the past 6 months without dieting?	1.Yes	0.No
12	Height: _____ m Weight _____ kg *BMI less than 18.5?	1.Yes	0.No
Eating			
13	Have you experienced more difficulty chewing tough foods than you did 6 months ago?	1.Yes	0.No
14	Do you ever experience choking or coughing when drinking soup or tea?	1.Yes	0.No
15	Do you feel uncomfortable feelings of thirst or dry mouth?	1.Yes	0.No
Socialization			
16	Do you go out at least once a week?	0.Yes	1.No
17	Do you go out less often than you did last year?	1.Yes	0.No
Memory			
18	Do others point out your forgetfulness or tell you "you always ask the same thing"?	1.Yes	0.No
19	When you want to make a call, do you usually search for the telephone number and call on your own?	0.Yes	1.No
20	Do you sometimes not know what the date is?	1.Yes	0.No
Mood			
21	(in the past 2 weeks) You feel no sense of fulfillment in your life.	1.Yes	0.No
22	(in the past 2 weeks) You cannot enjoy things that you enjoyed before.	1.Yes	0.No
23	(in the past 2 weeks) You feel reluctant to do things that you could do easily before.	1.Yes	0.No
24	(in the past 2 weeks) You do not feel that you are a useful person.	1.Yes	0.No

25	(in the past 2 weeks) You feel exhausted for no apparent reason.	1.Yes	0.No
Lifestyle comprises questions n°1 to n°20.			

*If Body Mass Index (=weight /height^2) <18.5, the respondent scores: yes/ 1 point.

Table 2 Subject Characteristics

Variables		Total n = 188 Valid % (n)	Semantic n = 6 Valid % (n)	Bilinguals n = 21 Valid % (n)	Validation n = 161 Valid % (n)
Age	Mean ± SD	69.52 ± 7.47	67 ± 9.91	73.81 + 8.98	69.05 ± 7.0
Gender	Female	74.5 (140)	100 (6)	71.4 (15)	73.9 (119)
Marital status	Single	4.8 (9)	0	4.8 (1)	5 (8)
	Married	54.0 (101)	16.7 (1)	47.6 (10)	56.3 (90)
	Divorced	7.0 (13)	16.7 (1)	4.8 (1)	6.9 (11)
	Widowed	34.2 (64)	66.7 (4)	42.9 (9)	31.9 (51)
Living situation	Alone	17.6 (33)	33.3 (2)	14.3 (3)	17.4 (28)
	With partner	30.3 (57)	0	23.8 (5)	32.3 (52)
	With child	21.8 (41)	16.7 (1)	23.8 (5)	21.7 (35)
	With partner and child	24.5 (46)	16.7 (1)	28.6 (6)	24.2 (39)
	Other	5.3 (10)	33.3 (2)	9.5 (2)	3.7 (6)
Educational level	Elementary school	42.3 (77)	50 (3)	33.3 (6)	43 (68)
	Junior high school	15.4 (28)	33.3 (2)	16.7 (3)	14.6 (23)
	High school	12.6 (23)	0	22.2 (4)	12 (19)
	University	25.8 (47)	0	16.7 (3)	27.8 (44)
	Other	3.8 (7)	16.7 (1)	11.2 (2)	2.6 (4)
Japanese descent	Yes	51.1 (95)	0	100 (21)	46.5 (74)
Activity	Work	22.9 (40)	66.7 (4)	10 (2)	22.8 (34)
	Volunteer	10.9 (19)	0	20 (4)	10.1 (15)
	Retirement	66.3 (116)	33.3 (2)	70 (14)	67.1 (100)
Medication	Yes	82.4 (155)	100 (6)	71.4 (15)	83.2 (134)
Number of medications	Mean ± SD	2.68 ± 2.24	4 ± 1.41	3.4 + 1.96	3.23 ± 2.07
Frequency of medical	None	12.5 (23)	0	14.3 (3)	12.7 (20)
consultation (last 6 months)	1-2 times	59.8 (110)	40 (2)	76.2 (16)	58.2 (92)
	3-4 times	17.9 (33)	20 (1)	9.5 (2)	19 (30)
	5 times or more	9.8 (18)	40 (2)	0	10.2 (16)
Hospitalization (last year)	Yes	12.4 (23)	16.7 (1)	4.8 (1)	13.2 (21)
Self-rated health	Very good to good	48.1 (90)	16.7 (1)	52.3 (11)	48.8 (78)
	Normal	34.8 (65)	33.3 (2)	33.3 (7)	35 (56)
	Not so good to bad	17.1 (32)	50 (3)	14.3 (3)	16.3 (26)
Life satisfaction	Very satisfied to satisfied	87.7 (165)	66.7 (4)	90.4 (19)	88.2 (142)

	Nor satisfied neither unsatisfied	6.9 (13)	16.7 (1)	4.8 (1)	6.8 (11)
	A bit unsatisfied to unsatisfied	5.3 (10)	16.7 (1)	4.8 (1)	4.9 (8)
BMI	Mean ± SD	26.15 ± 4.55	32.59 ± 5.25	24.24 + 2.79	26.16 ± 4.5

Table 3 Kihon Checklist - Brazilian Portuguese beta version

1	Você consegue usar ônibus ou trem sem necessidade de ajuda?	0.**Sim**	1.**Não**
2	Você faz compras para o seu dia a dia sem necessidade de ajuda?	0.**Sim**	1.**Não**
3	Você administra sua conta/poupança bancária sozinho (a)?	0.**Sim**	1.**Não**
4	Você visita à casa de seus amigos?	0.**Sim**	1.**Não**
5	Você conversa com seus familiares ou amigos?	0.**Sim**	1.**Não**
6	Você sobe escada sem o apoio de corrimão ou parede?	0.**Sim**	1.**Não**
7	Você se levanta da cadeira sem usar o braço da mesma como apoio?	0.**Sim**	1.**Não**
8	Você caminha mais do que 15 minutos?	0.**Sim**	1.**Não**
9	Você sofreu alguma queda (caiu) no último ano?	1.**Sim**	0.**Não**
10	Você sente medo de cair?	1.**Sim**	0.**Não**
11	Nos últimos 6 meses, você emagreceu 2 a 3 quilos (sem estar de dieta)?	1.**Sim**	0.**Não**
12	Qual a sua altura?_____m Qual o seu peso? _____kg *IMC menor que 18.5?	1.**Sim**	0.**Não**
13	É correto afirmar que "você não consegue comer alimentos de consistência dura tão bem como 6 meses atrás"?	1.**Sim**	0.**Não**
14	Você se engasga quando toma chá ou sopa?	1.**Sim**	0.**Não**
15	Você se sente desconfortável com a sensação de boca seca?	1.**Sim**	0.**Não**
16	Você sai de casa mais do que uma vez por semana?	0.**Sim**	1.**Não**
17	Em comparação ao último ano, você tem saído menos de casa?	1.**Sim**	0.**Não**
18	As pessoas tem chamado sua atenção quanto ao seu esquecimento, como: "você faz as mesmas perguntas o tempo todo"?	1.**Sim**	0.**Não**
19	Você faz ligações telefônicas checando você mesmo o número de telefone?	0.**Sim**	1.**Não**
20	É correto afirmar que "às vezes, você não sabe que dia ou mês é hoje"?	1.**Sim**	0.**Não**
21	Nas últimas 2 semanas, você está insatisfeito com sua vida diária?	1.**Sim**	0.**Não**
22	Nas últimas 2 semanas, você acha sem graça as atividade com as quais você se divertia antes?	1.**Sim**	0.**Não**
23	Nas últimas 2 semanas, você sente dificuldade ao fazer coisas que antes achava fácil de	1.**Sim**	0.**Não**

	fazer?		
24	Nas últimas 2 semanas, você sente que não é mais útil para os outros?	1.**Sim**	0.**Não**
25	Nas últimas 2 semanas, você se sente exausto sem razão?	1.**Sim**	0.**Não**

*Se Índice de Massa Corporal (=peso /altura^2) <18.5, o respondente assinala: sim/ 1 ponto.

Table 4 Relation between the Kihon Checklist-Brazilian Portuguese version and the Edmonton Frail Scale score (n=161)

Edmonton Frail Scale Total Score				
Kihon Checklist Domain	**Kendall's τ**	**p value**	**Regression Coefficient β**	**p value**
Factors	**Coefficient**		**R^2 = 0.387**	<0.001
Lifestyle	0.429	<0.001	0.073	0.788
Physical strength	0.367	<0.001	0.330	0.031
Nutrition	0.211	0.002	0.090	0.267
Eating	0.213	0.001	-0.005	0.966
Socialization	0.269	<0.001	0.075	0.433
Memory	0.285	<0.001	0.145	0.167
Mood	0.359	<0.001	0.196	0.014

Table 5 Differences of the Edmonton Frail Scale total score according to the frailty condition by Kihon Checklist cut-off points (n=161)

	Edmonton Frail Scale Total Score		
Kihon Checklist Domains	**Non-Frail**	**Frail**	**p value**
	Median (min-max), n	Median (min-max), n	
Lifestyle	3 (0 - 10), 157	6 (5 - 9), 4	0.015
Physical strength	2 (0 - 10), 138	4 (2 - 10), 23	<0.001
Nutrition	3 (0 - 10), 161	-	-
Eating	2 (0 - 10), 121	3 (0 - 10), 40	0.012
Socialization	3 (0 - 10), 113	5 (3 - 9), 48	0.002
Memory	2 (0 - 9), 77	3 (0 - 10), 84	<0.001
Mood	2 (0 - 9), 138	4 (1 - 10), 23	<0.001

Note: Analyzed using Mann-Whitney U test